12-19-06

JFW

CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10) Applicant(s): Brian Algar				Docket No. 7678.576a.1
Serial No. 10/069,143	Filing Date July 25, 2002	Confirmation No. 7688	Examiner Frederick F. Krass	Group Art Unit 1614
Invention: Glass Compositions				

I hereby certify that the Transmittal letter; certified copy of the priority document; and postcard are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: Commissioner for Patents, Box Issue Fee; P.O. Box 1450, Alexandria, VA 22313-1450 on December 18, 2006.

Ralene Eller

(Typed or Printed Name of Person Mailing Correspondence)

Ralene Eller

(Signature of Person Mailing Correspondence)

EV843998413US

("Express Mail" Mailing Label Number)

Certificate of Express Mail - IDS - RDN

PTO/SB/21 (09-06)
Approved for use through 03/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/069,143
Filing Date	July 25, 2002
First Named Inventor	Brian Algar
Art Unit	1614
Examiner Name	Frederick F. Krass
Attorney Docket Number	7678.576a.1

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☑ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

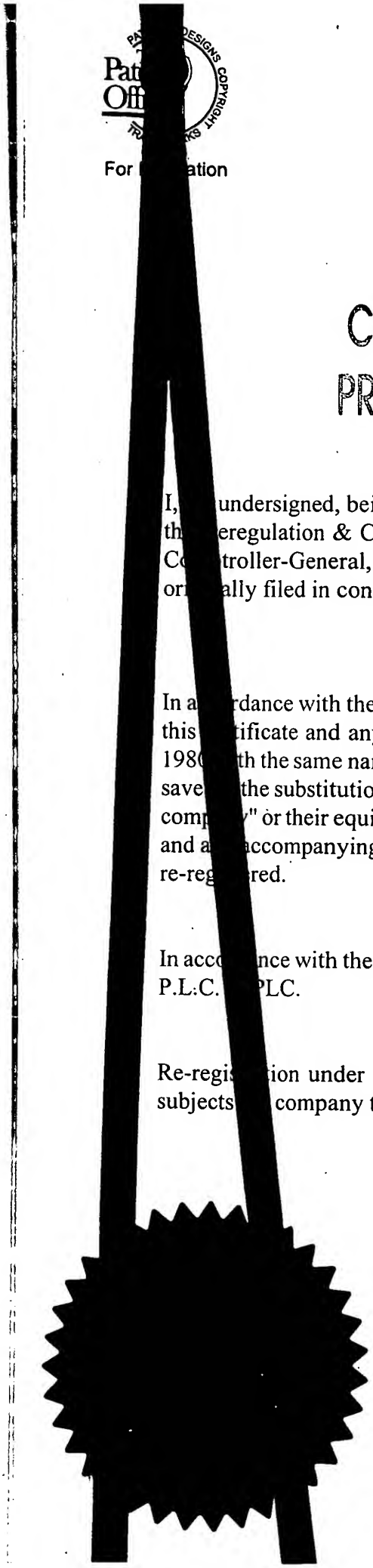
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name			
Signature			
Printed name			
Date		Reg. No.	

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Rick D. Nydegger		
Typed or printed name	Rick D. Nydegger	Date	December 18, 2006



For [illegible]ation

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

CERTIFIED COPY OF PRIORITY DOCUMENT

I, [illegible] undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of th[illegible]eregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Co[illegible]troller-General, hereby certify that annexed hereto is a true copy of the documents as or[illegible]ally filed in connection with the patent application identified therein.

In a[illegible]rdance with the Patents (Companies Re-registration) Rules 1982, if a company named in this [illegible]tificate and any accompanying documents has re-registered under the Companies Act 198[illegible]th the same name as that with which it was registered immediately before re-registration save[illegible] the substitution as, or inclusion as, the last part of the name of the words "public limited comp[illegible]" or their equivalents in Welsh, references to the name of the company in this certificate and a[illegible]ccompanying documents shall be treated as references to the name with which it is so re-reg[illegible]red.

In acc[illegible]nce with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. [illegible]PLC.

Re-regi[illegible]ion under the Companies Act does not constitute a new legal entity but merely subjects [illegible] company to certain additional company law rules.

Signed [illegible]

Dated 3 November 2006

Patents Form 1/77

Patents Act
(Rule 16)

The Patent Office

1/77

17AUG99 E469847-1 D02997
P01/7700 0.00 - 9919283.3

The Patent Office
Cardiff Road
Newport
Gwent NP9 1RH

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference — AJL/KJL/CT/P4870 — 14 AUG 1999

2. Patent application number *(The Pate* — 9919283.3 — 14 AUG 1999

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Brian Algar
23/24 Colomendy Industrial Estate
Denbigh
Denbighshire
LL16 5TA
United Kingdom

Patents ADP number *(if you know it)* 77206 83001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

A glass composition.

5. Name of your agent *(if you have one)*

ROYSTONS,

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Tower Building,
Water Street,
Liverpool. L3 1BA
Merseyside.

Patents ADP number *(if you know it)* 1438001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

No

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	14
Claim(s)	-
Abstract	-
Drawing(s)	1

10. If you are also filing any of the following, state how many against each item.

Priority documents	-
Translations of priority documents	-
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	-
Request for preliminary examination and search *(Patents Form 9/77)*	-
Request for substantive examination *(Patents Form 10/77)*	-
Any other documents *(please specify)*	-

11. I/We request the grant of a patent on the basis of this application.

Signature ROYSTONS Date 13/8/99

12. Name and daytime telephone number of person to contact in the United Kingdom

K.J. Lees - 0151-236 5147/1417

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.

b) Write your answers in capital letters using black ink or you may type them.

c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.

d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.

e) Once you have filled in the form you must remember to sign and date it.

f) For details of the fee and ways to pay please contact the Patent Office.

Title: A glass composition.

DESCRIPTION

The present invention relates to a glass composition, particularly but not exclusively for the improved treatment and/or prevention of dental caries.

Dental caries consists of demineralization of a tooth caused by bacteria. In the early stages of caries a white spot develops on the tooth and if the disease is not halted and reversed, the enamel surface breaks down to form a lesion. This can then lead to decay and eventually, a fractured tooth. It is well known that development of dental caries may be reduced by means of various factors, such as diet and oral hygiene measures, anti microbial treatments and the provision of fluoride to the teeth.

Current methods for administering fluoride include the fluoridation of drinking water, the ingestion of fluoride tablets, the incorporation of fluoride into mouth washes, dentifrices and foods, the topical application of fluoride solutions, gels and varnishes and recently, the incorporation of fluoride in dental materials and special devices. These have a variable effect on caries which is unpredictable on an individual basis and is dependent on patient compliance in following the prescribed regimen.

Evidence supports the concept of frequent applications of relatively low concentrations of fluoride ions for the elimination of caries. A sustained and controlled release delivery system could help to achieve this goal. At least three general approaches have been reported for the application of sustained and controlled slow releasing systems, being a sustained release ingested tablet or capsule (Masuhara et al 1985), incorporation of fluoride in dental cements (McClean & Wilson) and an intra-oral device attached to the teeth (Minth et al 1983). However, none of these devices has

proved to be suitable for use. They have either been susceptible to damage, an irritant to the mucosa or non acceptable to the patient.

Glass compositions for attaching to a tooth that release fluoride ions in the mouth to supplement dietary intake of fluoride have proved useful, where normal intake levels of fluoride are insufficient to give maximum reduction in the incidence of caries lesions in teeth.

A glass from which fluoride can be slowly leached was patented by Davidson (US Pat. No. 4,920,082). The glasses described therein consist of silicon dioxide, barium oxides, aluminium oxide and fluoride in specified ranges. However, the maximum fluoride which can be retained in this system is 7% by weight and batch melting temperatures in the range of 1300-1400°C are generally required. WO88/05652 also describes the preparation of novel dental composites that are claimed to release fluoride, incorporating fluorosilicate glass filters, the glass consisting essentially in weight percent of 15-50% Al_2O_3, 0-50% CaO, 10-65% SiO_2 and 0-14% F. Again, silicate glass is known to melt at high temperatures which is unfavourable.

The use of phosphate as a glass former has been known for many years. However, the disadvantage of these glasses is that they are easily attacked by water. This property has been exploited for the development of soluble glasses for use in animal health releasing copper, cobalt and selenium to the ruminant animal over 6 to 12 months as the glass dissolves (GB Pat. No. 2116424). A more slowly dissolving glass has been used to provide copper ions in an anti-fouling paint for use on ships. This glass was formulated to dissolve over 5 years (EP App. No. 94906287.1).

Hence, the glass compositions of the prior art have not proved entirely satisfactory for supplementing the dietary intake of fluoride. The low retention of the fluoride means that the release of fluoride is not maintained over a sufficiently long period of time. The low retention also requires a relatively large piece of glass to be fixed to the tooth of the patient to provide sufficient levels of fluoride release into the mouth. This is obtrusive and reduces the appeal of the device to a patient.

It is an aim of the present invention to provide a glass composition for the improved treatment and/or prevention of dental caries that aims to overcome the above mentioned drawbacks.

Accordingly, a first aspect of the present invention provides a glass composition having the general empirical formula given below, expressed in weight percent of the element:

P : 16-24

F : 5-30

O : 20-40

and at least one of Na, K, Li or Al in an amount up to a total of 34 wt.%.

Preferably, fluoride and/or oxides of glass modifiers, such as Al, Ca, and Mg, are included in the composition. The fluoride ions are preferably included as compounds such as AlF_3, $NaHF_2$, NaF, CaF_2, MgF_2 or KF.

Ca and Mg and/or other glass modifiers are preferably included in the composition in an amount 0-10 wt.%, more preferably less than 5 wt.%

The glass compositions of the present invention preferably provide a fluoride retention of at least 50% at a melting temperature of 650°C over 45 minutes, preferably

at least 60%. Preferably, the glass composition has a low solubility rate thereby allowing fluoride release from the composition for a period of 12-36 months. The glass compositions of the present invention may be attached to a tooth, for example being attached to a rear molar using standard dental cement or as a powder for adding to dental restorative materials, such as dental amalgams, thereby providing means to supplement fluoride release into saliva to assist in the prevention or reduction of dental caries.

More preferably, the composition includes a combined weight percent of at least 18% of sodium and potassium, more preferably 20-26 wt.%. Al is preferably included in an amount of at least 4 wt.%, more preferably 4-7 wt.%.

The composition preferably has at least 25 wt.% oxygen, more preferably 25-35 wt.%, has at least 16 wt.% phosphorous, more preferably 18-22 wt. %, and has at least 12 wt.% F, more preferably 15-25 wt.%.

The phosphorous may be included in the composition as an oxide, such as P_2O_5. The alkali metal compounds may be included as, for example, their oxides or fluorides.

The present invention will now be further illustrated by means of the following Examples in which Example 1 investigates the percentage fluoride retention for 25 samples of glass compositions according to the present invention and Example 2 investigates the percentage of fluoride in saliva following attachment of a glass composition of the present invention to a patient's tooth, and with reference to the accompanying drawing in which the percentage fluoride retention of the 25 samples investigated in Example 1 is illustrated.

Example 1

Table I of the accompanying drawing illustrates the composition parameters of 25 glass compositions according to the present invention, labelled 1-25 respectively. The percentage fluoride retained by each composition was calculated from determining the theoretical fluoride percentage of each sample and comparing this to the analysed level of fluoride found after the glass had been melted. The compositions were recorded as weight percentages of the elements. This was done to ensure the most accurate recording of percentage of fluoride retained. The method often used that involves recording the elements present as oxides and then recording the fluorine as a separate element is incorrect as the fluorine ions are taking the place of oxygen in the glass matrix. Assigning the fluoride ion to any particular element is also incorrect, as the actual location of the fluoride ion is unknown. The method used herein was therefore preferred and conversion to other older systems is easily achieved for comparison purposes.

The percentage fluoride retained by the samples is given in Table I of the accompanying drawing.

Example 2

The percentage of fluoride released into saliva following attachment of a glass composition of the present invention to a tooth was investigated.

The batch components using compositions according to the present invention were thoroughly mixed to ensure a homogeneous melt and loaded into platinum crucibles. The crucibles were then placed in an electric melting furnace at temperatures from 600-650°C, for times of up to 60 minutes to achieve good melting. The crucibles

were removed from the furnace and the glass cast onto a moulding plate containing a number of circular holes of 4mm in diameter and 6mm in depth. The glass was rolled to force it into these cavities and when solidified it was removed from the plate and transferred to an annealing oven to slowly cool and remove any residual stress.

Before use, the devices were smoothed of any rough edges with a sharp diamond burr. Three tests were carried out with human subjects and the results are reported in Tables II – IV below. The device was attached to the buccal aspect of the first maxillary permanent molar because of its nearness to the opening of the parotid gland. It was felt that the salivary flow would help to distribute the fluoride to other parts of the mouth. The tooth was cleaned using a fluoride-free prophylaxis paste. After cleaning, the tooth was washed, dried and the buccal surface etched for one minute with the etch available in the composite kit. (Prisma Fil-Predosed High Density Composite, The L.d. Chalk Company, Division of Dentsply International Inc., Milford, Delaware 19963, U.S.A.). The glass was etched for twenty seconds. Both were washed, dried and a thin layer of a light cured bond from the composite kit brushed on the tooth and the glass. The glass, held by tweezers, was adapted to the tooth and cured by visible light. While temporarily held in place, a layer of light cured composite was adapted around the glass using a plastic instrument. This composite helps to retain the glass, blocks out any under cuts and makes the whole device smooth to the tongue. Once cured, the glass and composite were further smoothed with a white stone burr and a layer of fissure sealant placed on the composite and cured to give a smoother surface. Control of moisture was very important throughout this procedure. Care was taken not to cover the exposed releasing surface of the glass with any composite, bond or fissure sealant.

In these studies, efforts were made to ensure that the fluoride in saliva could be accurately and repeatedly determined. The method employed was that of Taves (Separation of fluoride by rapid diffusion using hexamethyldisiloxane, Tahanta 15, 969-974, 1968), in which fluoride was diffused from the samples using hydrochloric acid saturated with hexamethyldisiloxane $(CH_3)_3$ $SiOSi(CH_3)_3$(HMDS). Fluoride was collected in sodium hydroxide before its determination by a fluoride ion electrode.

For each sample of saliva, between 1.0 and 2.0g (depending on the sample size) was weighed into a 60x15mm polystyrene petri dish (Falcon Plastics Cat No. 1007, Fahrenheit Lab. Supplies, Leeds). This avoided the difficulty of trying to accurately pipette this viscous material. Distilled water was added to make the final volume of 3.0ml. Polystyrene tube caps (Falcon Plastics Cat No. 2051, Fahrenheit Lab. Supplies, Leeds.), with the rims reduced by a half, were placed in the centre of each dish.

0.1ml of 1.65M NaOH containing P-nitrophenol and phenophthalein as an indicator was added to the centre of each well to ensure that the trap remained alkaline and therefore was able to trap the fluoride. An alkaline trap remained pale yellow in colour while an acidified trap turned pink. The lids were then sealed on the petri dishes using petroleum jelly around the rims. Finally 1.0ml of 6.0M HC1 with HMDS was added to each dish via a small hole previously made in the lid and the hole sealed immediately with petroleum jelly and a square of sealing tissue.

The samples were placed on a rotary shaker at 200 rotations /minute and left to diffuse overnight which was usually 16 hours. The following morning the lids were prized off and a note made of any of the dishes which had not formed a vacuum since loss of the vacuum had been shown in preliminary tests to be an indicator that fluoride had been lost

from the system. Each of the caps were removed and placed in an oven at 100°C until the NaOH had become crystalline.

After drying the NaOH the caps were placed on their test tubes and shaken with 0.34M acetic acid to dissolve the crystals and bring the pH to 5.2 for its determination by a combination fluoride ion electrode. Fluoride standards of 0. 05, 0. 1, 0. 5, 1. 0 and 5. 0 ug/ml F were prepared in identically buffered solutions to the sample solutions and were used to construct a standard curve. The fluoride concentrations in the unknown diffused samples were measured from this curve using an Orion combination fluoride ion electrode and Orion 920A Ionanalyser (Orion Research Inc., Cambridge, MA.). From the concentrations of the diffused solutions, the concentrations of fluoride in the original sample were calculated.

In all analyses, known fluoride standards and blanks were also diffused to determine the percentage diffusion that was occurring. The level of diffusion varied between 96.0 and 108% where a vacuum had been maintained. When known samples of fluoride solutions were diffused, the standard deviation between the recoveries was usually less than 1.0%.

Fluoride blanks were also run in this system. These included HC1-HMDS + water or NaOH alone. Fluoride was not measurable in the water or the HC1 after it had been saturated with the HMDS. It appeared that the NaOH was the main contributor to the small blank of 0.002 ug/ml F.

A check was made to determine if the fluoride concentration changed if the analyses were not done on the day of collection since it was possible that there would be too many samples to handle on some of the days when a study of salivary fluoride was

being carried out and/or because laboratory facilities were not available every day. Therefore, duplicate analyses were carried out on samples which had been kept up to 7 hours at room temperature and on samples which had been stored up to 10 days at - 12°C. The former was to check if study subjects could take part in collecting saliva while going about their normal work and bring the samples for analysis at the end of the collection period. The latter was to allow for the collection and storage of saliva samples when laboratory facilities were not available or for when the numbers of samples had built up beyond those which could be readily handled. No differences were found in the fluoride levels analysed immediately, after up to 7 hours or after 10 days at -12°C.

The recovery of fluoride and reproducibility of the method were checked by using known standards and by carrying out repeat analyses on the same samples. The results of these preliminary analyses are shown in Table II below.

Table II

Reproducability and Recovery of Fluoride After Diffusion of Samples in HMDS-HC1

Sample		No of Tests	Known F^{-}[1]	Determined F^{-}		Recovery
No 2	(ml solution)		F^{-}	F^{-}	SD[3]	(%)
1	1	4	0.05	0.045	±0.002	90
2	1.0	4	0.1	0.092	±0.010	92
3	0.5	6	0.5	0.475	±0.030	95
4	0.5	3	1.0	0.940	±0.010	94
5	0.2	2	5.0	4.900	±0.008	98
6	Dist H_2O	10	NIL	<0.005	±0.000	
7	Whole resting saliva	6	Unknown	0.010	±0.003	
8	Whole resting saliva	10	Unknown	0.015	±0.005	

[1]F =	Fluoride concentration in ug/ml
[2]Samples	1,4 and 7 were from one standard solution or one saliva source and analysed at the same time. 2, 5, and 6 were from known solutions or distilled H_2O prepared and analysed at different times. 3 and 8 were from one solution or one saliva source analysed at different times.
[3]SD =	Standard deviation.

The results show that the recovery of fluoride by the test system was better than 90%. There was therefore an error of only 10%, which was thought to be very good, and the system was acceptable.

Table III below shows the fluoride concentration in saliva of a subject fitted with a device made from glass composition 16 in Table I of the accompanying drawing. A marked high increase in fluoride level in saliva was observed within the first three days. This level then settled down to a steady 0.025 - 0.035 ug/ml., giving on average a three-fold increase from the 0.09 - 0.12 ug/ml base line. The effect of the device was still clearly seen even after a year and a half in place in the subject.

Table III

Fluoride Concentration in µg/ml. of saliva for subject fitted with glass 16

		Fluoride Concentration ug/ml
Base line	Day 1	0.012
	Day 2	0.009
Treatment	Day 1	0.063
	Day 2	0.039
	Day 3	0.069
	Day 4	0.031
	Day 5	0.028
	Day 6	0.037
	Week 1	0.036
	Week 2	0.025
	Week 3	0.024
	Month 1	0.030
	Month 2	0.030
	Month 3	0.036
	Month 4	0.038
	Month 5	0.034
	Month 6	0.033
	Year 1	0.03
	Year 1.5	0.05

Table IV below shows the averaged fluoride concentration in saliva of two subjects fitted each with a device made from composition 14 in Table I of the accompanying drawing. A marked high increase in fluoride level in saliva was again observed at the start but this time only for the first two days. This level then settled down to a steady 0.02 - 0.025 ug/ml, giving on average a two and a half fold increase from the 0.009 ug/ml base line. The device was still effective up to the four month point when it was removed.

Table IV

Averaged Fluoride Concentration in µg/ml. of saliva for two subjects fitted with glass 14

		Fluoride Concentration g/ml.
Base Line	Day 1	0.009
	2	0.009
Treatment	Day 1	0.056
	2	0.053
	3	0.023
	4	0.024
	5	0.024
	6	0.035
	Week 1	0.025
	2	0.022
	3	0.023
	Month 1	0.025
	2	0.017
	3	0.022
	4	0.022

Table V below shows the averaged fluoride concentration in saliva of four subjects fitted each with two devices made from glass composition 14 in Table I of the accompanying drawing. Again the level of fluoride was high for the first three but then settled down to around the 0. 035 ug/ml., a level which was a three and a half fold increase over the base line. There was also an unusually high level of fluoride recorded at weeks 1 and 2.

Table V

Averaged Fluoride Concentration in µg/ml of saliva for four subjects each filled with two devices of glass 14

		Fluoride Concentration µg/ml
Base Line	Day 1	0.01
	Day 2	0.01
Treatment	Day 1	0.043
	2	0.053
	3	0.045
	4	0.034
	5	0.041
	6	0.032
	Week 1	0.067
	2	0.054
	3	0.033
	Month 1	0.036
	2	0.033
	3	0.035
	4	0.033
	5	0.035
	6	0.032

The results clearly show that high levels of fluoride can be retained by the glass compositions of the present invention, up to 15% in the compositions included in Table I, with acceptable levels of fluoride retention (up to 67% in the composition of Table I). Additionally, melting temperatures can be kept low, generally at 650°C or less. The glass compositions also allow fluoride to be released from the glasses for up to at least 1½ years, as illustrated in Table III. Furthermore, the level of fluoride released from the composition can be adjusted by changes in retained fluoride, glass composition and the number of devices used, as shown in Table I and III to V. Hence, the compositions of the present invention provide a glass containing fluoride for insertion into the mouth for a slow

continuous release of fluoride ions, the glass being fitted either by attachment of a formal article of the glass to a tooth, being held in place by a dental plate or by incorporation of glass in a powder form as a dental restorative.

Table I

Glass Compositions and Analysies

Code	Na	P	Al	F	O	K	Ca	Mg	Na+ K	F Analysed	Solubility	Melt Temp	Melt Time	Fluoride Retention
1	21.23	20.67	6.76	19.48	31.86	0	0		21.23	10.4	149	650C	45MIN	53.39
2	22.47	20.37	6.22	19.54	31.39	0	0		22.47	10.97	503	650C	45MIN	56.14
3	23.68	20.08	5.69	19.6	30.94	0	0		23.68	11.81	2920	650C	45MIN	60.26
4	21.54	21.18	6.26	18.37	32.64	0	0		21.54	10.94	288	650C	45MIN	59.55
5	21.16	20.81	5.27	18.94	32.07	0	0	1.75	21.16	11.45	215	650C	45MIN	60.45
6	21.23	20.67	6.76	19.48	31.86	0	0		21.23	11.42	149	650C	45MIN	58.62
7	21.13	20.87	4.55	18.67	32.17	0	0	2.59	21.13	11.78	305	650C	45MIN	63.10
8	22.88	20.27	6.04	19.56	31.25	0	0		22.88	12.01	1385	650C	45MIN	61.40
9	23.28	20.17	5.87	19.59	31.09	0	0		23.28	12.15	2513	650C	45MIN	62.02
10	23.21	19.68	6.22	20.56	30.33	0	0		23.21	11	1816	650C	45MIN	53.50
11	22.72	20.31	6.11	19.56	31.3	0	0		22.72	12.03	1962	650C	45MIN	61.50
12	22.91	19.16	6.72	21.68	29.53	0	0	0	22.91	14.11	1684	650C	45MIN	65.08
13	23.14	18.55	6.97	22.76	28.59	0	0	0	23.14	14.95	1715	650C	45MIN	65.69
14	21.9	20.13	5.27	19.94	31.02	0	0	1.75	21.9	13.22	405	650C	45MIN	66.30
15	22.63	19.44	5.26	20.94	29.97	0	0	1.75	22.63	14.06	661	650C	45MIN	67.14
16	22.13	18.76	5.26	22.3	28.92	0	0	2.62	22.13	14.79	685	650C	45MIN	66.32
17	21.83	18.24	5.75	23.42	28.12	0	0	2.64	21.83	14.86	560	650C	45MIN	63.45
18	14.92	20.67	6.76	18.04	31.86	7.75	0	0	22.67	11.15	61	650C	45MIN	61.81
19	14.29	19.79	6.25	19.71	30.5	7.68	0	1.78	21.97	12.42	100	650C	45MIN	63.01
20	22.07	21.09	6.01	18.34	32.5	0	0	0	22.07	11.2	194	650C	45MIN	61.07
21	21.85	21.68	5.76	17.29	33.42	0	0	0	21.85	10.2	574	650C	45MIN	58.99
22	18.95	19.44	5.26	20.1	29.97	4.53	0	1.75	23.48	12.6	389	650C	45MIN	62.69
23	21.23	20.67	6.76	19.48	31.86	0	0		21.23	11	130	650C	90MIN	56.47
24	21.23	20.67	6.76	19.48	31.86	0	0		21.23	10.2	79	650C	180MIN	52.36
25	18.95	19.44	5.26	20.1	29.97	4.53	0	1.75	23.48	13.41	466	600C	45MIN	66.72